

What is claimed is:

1. An operation control method for a fuel cell, wherein the fuel cell is connected to an AC power system through a power converter and electric power is supplied to a load from a connection portion  
5 between the AC power system and the power converter, and the power instruction value is applied to the power converter in accordance with the load power, the method comprising steps of:  
detecting the voltage of the fuel cell; and  
reducing the limit value of the power instruction in response  
10 to the drop of the fuel cell voltage; and  
setting the power instruction value as the limit value when the voltage of the fuel cell reduces to a first threshold value.
2. An operation control method for a fuel cell according to  
15 claim 1, wherein the output current of fuel cell begins to fall down when the fuel cell voltage falls down to the first threshold value, and the electric power instruction value is reduced to zero when the fuel cell voltage falls down to the second threshold value.
- 20 3. An operation control method for a fuel cell according to claim 2, wherein the first threshold value is a voltage drop alarm level and the second threshold value is a voltage drop protection level which suspends the electric power converter.
- 25 4. An operation control method for a fuel cell according to claim 1, further comprising detecting the output current of the fuel cell, obtaining the difference between the electric power instruction

value and the output current, adjusting a duty instruction value so that the difference may be set to 0, and making the duty instruction value the gate pulse of the electric power converter after comparing with a triangular wave.

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5. An operation control apparatus comprising:

a fuel cell;

a power converter connected between said fuel cell and the AC power system;

10 a load receiving the electric power from connection portion between said fuel cell and the AC power system;

a power instruction means for outputting the power instruction value of the fuel cell to the power converter in accordance with the load power, and

15 a limiter for detecting the fuel cell voltage and reducing the limit value of the power instruction value in accordance with the fuel cell voltage drop and the power instruction value being set as the limit value when the fuel cell voltage falls down to the first threshold value.

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6. An operation control apparatus for a fuel cell according to claim 5, wherein the power instruction value is reduced to zero when the fuel cell voltage falls down to the second threshold value.

25 7. An operation control apparatus for a fuel cell according to claim 6, wherein there is a relationship of the following formula (1) between the limit value and the fuel cell voltage.

$$ILIM(E_f) = I_{max} / (E_{al} \cdot E_{pr}) \times E_f \cdot I_{max} \times E_{pr} / (E_{al} \cdot E_{pr}) \cdots (1)$$

Where  $ILIM$ : limit value,  $E_f$ : fuel cell voltage, and  $E_{al}$ : first threshold value and  $E_{pr}$ : second threshold value, and  $I_{max}$ : rating output current of the electric power converter.

8. An operation control apparatus for a fuel cell comprising:
  - a fuel cell;
  - a power converter connected between said fuel cell and an AC power system, the power converter including a first converter for controlling DC output voltage of the fuel cell and a second power converter for connecting the first converter with the AC power system;
  - a load receiving the electric power from connection portion between said fuel cell and the AC power system,
  - a power instruction control means to supply the power instruction value of the fuel cell with the power converter in accordance with the load power; and
  - a limiter for detecting the fuel cell voltage and reducing the limit value of the power instruction value in accordance with the drop of the fuel cell voltage and setting the power instruction value as the limit value when outputting the power instruction value from the power instruction control means to the first converter.
9. An operating control apparatus according to claim 8, the limit means reduces the power instruction value to zero when the fuel cell voltage falls down to the second threshold value.

10. An operation control apparatus for an fuel cell according  
to claim 8, wherein the first converter comprises a DC/DC converter,  
and the second converter comprises an inverter, and the inverter  
5 detects AC voltage and AC current and is controlled by the operation  
controller which generates the gate signal for driving the inverter.